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MINERALOGY OF CERES' FEJOKOO (AC-5) QUADRANGLE

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The Dawn spacecraft orbited the dwarf planet Ceres beginning March 2015, mapping the planet with a framing camera (FC), visible and infrared spectrometer (VIR) and gamma-ray and neutron detector (GRaND) [1]. We examine the spectral reflectance of surface features in the Fejokoo quadrangle located within 21-66 °N and 270-360 °E, and address the following scientific questions:

1. What is the surface composition in this quadrangle?

2. How does it compare to the global composition of Ceres?

3. Is there a correlation between morphological features and surface composition?

4. What are the implications for the formation and evolution of Ceres' surface?

Hughson et al. (2016, in prep) describe the terrain in Fejokoo as highly cratered [2] and it is suitably termed ancient. The largest crater, Fejokoo, is hexagonal in habit and 68 km mean diameter. Topography [3] reveals six tholi that are ~20 x 20 km in lateral extent and ~3 km high. Our analysis focuses on data returned from VIR [4] and displayed as spectral parameter maps as in [5] and ortho-rectified FC images comprising controlled photomosaics of Ceres [6]. The spectral reflectance and significant spectral parameters are largely uniform across the region and consist of a relatively flat spectrum between 0.5-2.6 µm, a UV absorption edge shortward of 0.4 microns and a complex of near-IR absorptions that represent a mixture of ammoniated phyllosilicate, carbonates and a spectrally dark component that cannot be specifically identified [7]. The crater Oxo stands out by the additional presence of water ice features [8] and at least five other small, bright spots show spectral variations from surrounding material of varying compositional significance. Ceres surface has been uniformly covered with dark clays and carbonates while exposure of materials from beneath the top-coating layer, at discrete locations have different spectral parameters and thus variable composition.

[1] Russell C. T. and Raymond, C.A.., 2011, SSR 163, 3-23 [2] Hughson et al. 2015 AGU Fall Meeting. Agu, 2015 [3] Preusker et al. 2016 LPSC #1954 [4] De Sanctis M.C. et al., 2011, SSR 163, 329-369 [5] Ammannito, E. et al. 2016 Science, in press [6] Roatsch, T. et al. 2016, PSS doi:10.1016/j.pss.2016.05.0117 [7] DeSanctis et al. 2015, Nature, 528, 241-244 [8] Combe J-Ph. et al., 2016, LPSC #1820

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T159. Ceres' Surface Composition as an Indication of Interior Evolution (Posters)
Monday, 26 September 2016: 9:00 AM-6:30 PM

Exhibit Hall E/F (Colorado Convention Center)

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